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ABSTRACT

The impact of teaching computer literacy on the social studies curriculum, instruction, and teacher education is discussed. Social studies computer literacy objectives are organized into three components: awareness, understanding how computer technology affects individuals and society; acquisition, knowing how computers work and how to operate a computer; and application, employing computer technology to solve problems and develop intellectual skills. Some of the 17 objectives contained within these categories are to know historical events in the development of computers, understand their future impact on society, evaluate legal and ethical questions, know uses of computers in business and industry, know how to use computers as a tutor and to simulate events, write computer programs, and apply computer resources in making decisions. Although social studies content should examine historical, sociological, psychological, political, and economic implications, the legal and ethical questions related to computer use are of major concern. New instructional modes should include tutorial, drill and practice, simulation, and problem solving. Teachers should know the uses of computers for management, sources of computer hardware and social studies software and how to evaluate them, and how to write social studies computer assisted programs. Teacher courses should be offered at the undergraduate and graduate levels. (KC)

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COMPUTER LITERACY AND SOCIAL STUDIES TEACHER EDUCATION: CHANGES IN FORM AND CONTENT

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COMPUTER LITERACY AND SOCIAL STUDIES TEACHER EDUCATION: CHANGES IN FORM AND CONTENT

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The rapid changes in computer technology in recent years has had a profound impact on society. The information age is upon us, and we as educators must acknowledge the important role we must play in preparing individuals for a society which employs computer technology in both industrial and personal endeavors. Social studies educators have a vital role in helping students prepare for the present and future computer technology oriented society. Unfortunately, the vast majority of social studies educators are unprepared for this task. The professional literature in social studies education is, relatively, devoid of information on the history of computers and related technologies as well as the skills necessary to utilize these technologies in the classroom (note 1). The lack of attention to computer technology is a problem which requires immediate attention by social studies educators as well as educators in general (A Nation At Risk: The Imperative for Educational Reform, 1983).

The purpose of this paper is to discuss a meaning of computer literacy as it pertains to elementary, middle, and high school students. From this definition, the role of social studies education in developing computer literacy is examined. Utilizing the basic role of social studies in developing computer literacy, the impact on social studies curriculum and instruction in schools is described. With this background, the changes in social studies teacher education necessary to develop the ability of social studies teachers to help student attain computer literacy is discussed.

Computer Literacy

Numerous articles have been written on a general definition of computer literacy (e.g., Elsele, 1980; Johnson, Anderson, Hansen and Klassen, 1980; Hunter, 1981-82; Inskeep, 1982). Although there is variation, and at times disagreement (e.g., Luehrmann, 1981), in these definitions, Sesow and Stricker (1982) found enough consistency to indicate that three main components are involved in the concept of computer literacy. The first major component is **awareness** and involves understanding how computer technology affects individuals and society. The second major component is **acquisition** and includes knowing how computers work and how to operate a computer. The third component is **application**

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and constitutes employing computer technologies to solve problems and develop intellectual skills.

Social Studies Computer Literacy Objectives

Examination of the more specific meanings that Sesow and Stricker (note 2) attached to the components of awareness, acquisition, and application provides a means of isolating the role of social studies in developing computer literacy. There are 17 general computer literacy objectives for which social studies has a major or joint responsibility.

Under the component of **awareness** social studies has a major responsibility for developing the following general objectives:

1. Know how use of computers will improve one's life.
2. Know the historical events preceding the development of computers and microcomputers.
3. Understand the potential impact of computers on one's life.
4. Understand the future impact of computers on individuals and society.
5. Evaluate the legal and ethical questions related to computer use.
6. Analyze one's attitudes about using computers.
7. Know how computers can be used for telecommunications and satellite communications.
8. Know the changes in vocational fields as a result of use of computer technology.
9. Analyze the attitudes and values others place on computers.
10. Know the possible uses of computers in business and industry.

Under the component of **acquisition** social studies has a joint responsibility for the following general objectives:

11. Know how to use computers to assist in homework assignments.
12. Know how to use computers as a tutor.
13. Know how to use computers to simulate real events.

Under the component of **application** social studies has joint responsibility for the following general objectives:

14. Uses computers to collect, store and retrieve data.
15. Writes computer programs to solve problems.
16. Demonstrates ability to work with others to solve problems.

17. Applies computer resources to make decisions in one's personal life.

Non-Social Studies Objectives

The development of the acquisition component is a prerequisite to developing the application component. Therefore, if a school or school system does not have the course or courses necessary to develop the acquisition component, then social studies will have to expand its role and develop these important prerequisites.

Under the definition articulated by Sesow and Stricker, the component of **awareness** is fully covered under the social studies objectives. Under the component of **acquisition**, the following non-social studies oriented objectives need to be developed to help students attain computer literacy:

1. Know how to operate a computer and related technologies.
2. Know the theory of computer operations.
3. Know how to use computers to assist in learning basic skills
4. Understand the capabilities and limitations of computers.
5. Know how to keep records on computers
6. Know how to program a computer
7. Know how to use computers for word processing.

Under the component of **application** the non-social studies objectives are:

8. Demonstrates creative use of computers.
9. Writes learning programs to be used by others.
10. Write programs for one's own use.
11. Write programs to increase one's productivity.
12. Uses computers to examine new areas of learning.
13. Shares developed programs with others.

Social Studies Content and Form

Based on the acceptance that social studies does have a responsibility in developing computer literacy, then examination of the general objectives listed above imply a need to change both the content used in social studies as well as the forms of delivering social studies content. It is important to remember that computer technology is both a **subject** matter to be studied plus an **instructional** tool to be used during classroom activities. Social studies has the major responsibility to use computer technology as a subject matter for the awareness component of computer literacy. The joint responsibility to develop the acquisition and application components of computer literacy is

fostered through use of computer technology as an instructional tool.

New social studies content. The "new" content in social studies should include examination of computer technology in the past, present, and future. Social studies needs to present information on the historical nature of computer technology as it affected individuals and society. Current events related to computer technology needs to be included in all social studies courses to make students aware of changes in vocational fields and leisure time. Future studies need to be included in social studies which examine computer technology in order to prepare students for potential changes in individual lifestyles and society.

Although the historical, sociological, psychological, political, and economic implications of computer technology are important content for social studies, the issue of legal and ethical questions related to computer use and abuse are of major importance. Computer technology allows a great deal of information to be gathered on individuals and groups, and the potential for abuse is high. Computer theft is a present problem also and will likely increase in the future. Therefore, individuals will need to establish a sound value system based on legal-moral democratic principles to limit the abusive use of computers, and social studies must deal with these ethical and legal issues in the classroom.

To aid in developing computer literacy does not demand that social studies abandon traditional content in coursework. But it does demand that history teachers go beyond current textbook information and focus some class time on the history of computer technology. Likewise, in the other social science courses the traditional contents are not to be abandond. Rather the emphasis on topics related to computer literacy should be included.

New forms of instruction. The acquisition and application objectives for which social studies has joint responsibility requires the use of computers and related technologies in the classroom. Basically there are five types of computer assisted instructional modes which social studies need to utilize: **tutorial mode, drill and practice mode, gaming mode, simulation mode,** and **problem solving/research mode** (note 3).

Social studies teachers can use the tutorial or drill and practice modes instead of the typical worksheet or workbook exercises with traditional social studies content. With either of these modes, students can work towards some specified level of mastery before going to another topic, and information on each student's performance can be stored for teacher use later. At the same time students would be developing the acquisition computer literacy objective of know how to use computers as tutor.

Gaming and simulation modes can be used in social studies classrooms in both individual and group settings. For gaming, computers can randomly pick questions, keep score, and make decisions on the winners with great speed. For simulations, computers can accept input from students, make decisions according to some underlying model, report results without the time consuming work of "calculating" preformed in traditional simulations. Using these modes with traditional social studies content develops the acquisition and application computer literacy objectives of knowing how to use computers to simulate real events, and demonstrates ability to work with others to solve problems.

One of the greatest potentials for computer use in social studies classrooms is with the problem solving/research mode. Computers can use package programs or be programmed by students (with teacher aid) to accept information and process information needed to solve some problem or provide evidence for research questions. Also, computers can access information from large data banks through telephone connections in order to acquire needed information to solve a problem or provide evidence for research questions. Using this mode simultaneously develops all the application social studies computer literacy objectives listed earlier.

An added benefit of using computers assisted instruction is the ability to individualize instruction. When a student has particular difficulties in learning material, he/she can use the computer for remediation work. Likewise, when a student has completed normal assignments, he/she can use the computer for enrichment activities.

Social Studies Teacher Education

To this point the discussion has focused on the general meaning of computer literacy and the role of social studies in developing computer literacy in students. Obviously, social studies teachers will need to become computer literate. Examination of the general objectives for students listed above forms the basis for objectives related to computer literacy for social studies teachers. However, the definition of computer literacy for teachers must be expanded to provide the skills necessary to use the five modes of computer assisted instruction.

Besides the 10 **awareness** objectives listed for students, social studies teacher education programs must develop the additional objectives of:

1. Know the possible uses of computers for management (i.e., test construction, record keeping, preparation of course materials) and instruction.
2. Know sources of computer hardware and social studies educational software.

Social studies teachers need to develop the social studies and non-social studies acquisition and application objectives listed for students. In addition to the acquisition objectives for students, social studies teachers need to:

1. Know how to evaluate computer hardware and social studies educational software.
2. Know how to write social studies computer assisted instruction programs.

Social studies teachers need to also attain the following application objectives :

1. Use mini-authoring systems to develop social studies drill and practice and tutoral programs.
2. Use authoring languages to develop social studies gaming, simulation, and problem solving programs.
3. Use packaged programs for management and social studies instruction.

To develop all these objectives, social studies teacher education programs must alter the present content and form of their programs.

Content of Social Studies Teacher Education Programs

To help teachers achieve computer literacy, information on the history, current status, and future implications of computer technology should be taught. This information should be taught in a separate course or as part of an existing course. The course could be from arts and sciences or education. But, within such a course, extensive discussion of the legal and ethical issues of computer technology should be included to provide the proper background for social studies teachers.

To develop the objectives related to operation and use of computer hardware and social studies software, several courses should be developed. A course is needed to develop skills necessary to operate computer hardware and social studies software, use management and instructional programs, become familiar with the native language of the computer (BASIC), and use the computer for word processing. A second course should be taught which teaches how to form text files, use programming languages, and utilize related technology such as videodics, modems, etc. For social studies teachers who want to become developers of computer related materials, a third course encompassing more advanced programming procedures should be offered.

To develop the awareness, acquisition, and application objectives for students, teachers will need the background information on computer technology and the first two course in operating computer hardware and software. The background and

first course should be made available in the preservice teacher education program (and in a graduate program for inservice teachers who have not had preservice training). The second course would be for inservice teachers on the graduate level. As noted by Wells and Bitter (1982), inservice workshops do not provide the time to adequately train teachers to be computer literate. Inservice workshops can help develop computer **awareness**, but do not provide the time necessary to develop the **acquisition** and **application** objectives for a computer literate social studies teacher.

The third advanced course mentioned should be located in a graduate program. Most social studies teachers would not need to attain these advanced skills to handle the acquisition and application computer literacy objectives for students. However, such a course would be useful to the very few social studies educators who want to produce social studies course materials for themselves or others.

The idea that teachers, including those in social studies, need to be able to program has been advocated by others (e.g., Beck, 1980; Lopez, 1981). However, this does not mean social studies teachers need to use machine language or assembler language to accomplish the task of writing programs for classroom use. There are a number of mini-authoring systems (Brockman, 1982), and programming languages (e.g., PILOT) which make the task of program writing easier.

Form of Social Studies Teacher Education Programs

To successfully develop the acquisition and application teacher computer literacy objectives, coursework taken in social studies curriculum and instruction should use computer assisted instruction. Preservice and inservice teachers should be exposed to using computers as they learn about management and instruction in social studies classrooms.

Tutorial, drill and practice, and simulation modes of instruction with computers should be used to develop managerial and instructional skills. Packaged programs should be used to help preservice and inservice teachers write lesson plans, construct tests, and score and grade tests. Word processing systems should be utilized to prepare class materials.

In addition, demonstrations of instructional materials related to computer technology should be included in any preservice or inservice course. This should include the use of data banks for the problem solving/research mode and vidiosystems for tutorial, gaming, simulation, and problem solving/research modes.

The use of computer assisted instruction in actual coursework taken would provide an additional benefit. Individualized training of social studies teachers can be done without the time

consumption of the past. Preservice and inservice teachers can work towards mastery of the traditional content of social studies education courses, and at the same time develop their computer literacy.

Conclusions

The major purpose of this paper was to outline the needed changes in social studies teacher education in the era of the computer revolution. Like Beck (1980), this author used the definition of computer literacy for students to guide the decisions on what social studies teacher education **should** be like.

In the suggested content for social studies teacher education, there is an emphasis on teacher programming. Some may dispute the need for teachers to program computers; however, without this skill (on an intermediate level) teachers will not be qualified to use the problem solving/research mode. It is this author's contention that the problem solving/research mode of instruction is the most useful mode to enhance computer literacy in students (as well as enhancing traditional social studies content).

A major implication of the suggested changes in content and form of social studies teacher education is the need for social studies teacher educators to become computer literate. In addition, colleges of education must find the resources to provide social studies teacher educators with the ability to implement the changes suggested. Without the retraining of social studies teacher educators and the resources, developing computer literate social studies teachers is impossible. In turn, social studies teachers who are not computer literate cannot develop computer literacy in students. It is, therefore, the training institution which will determine whether a computer literacy society will be achieved.

Notes

[1]There have been writings on computer technology and social studies (e.g. Diem, 1981), presentations at annual meetings (e.g., Martorella, 1983), and a special section in the May 1983 issue of Social Education. In comparison with the magnitude of the literature on computer literacy and computer assisted instruction, however, social studies writings on the subject are very small.

[2]The source of the more specific meaning of awareness, acquisition, and application came from the **Computer Literacy Needs Assessment** instrument developed by Sesow and Stricker.

[3]Tutorial mode involves providing text to a student followed by questions covering the material. Within most tutorial programs, respondents continue working on the material until a specified level of mastery is attained. Drill and Practice mode involves mere questions on a topic with students working toward a specified level of mastery. Gaming and simulation modes are merely computer application of traditional gaming and simulation instruction in social studies. Problem solving/research mode requires students to program a computer for data processing or use package data processing programs to analyze information on a given topic.

References

A nation at risk: The imperative for educational reform. Washington, D.C.: Department of Education, 1983.

Beck, J. Computer literacy for elementry and secondary teachers. 1980. (ERIC Document Reproduction Service No. ED 208 868)

Brockman, F. Creating your own software with mini-authoring systems. Electronic Learning, March 1982, 72-75.

Diem, R. Computers in the social studies classroom. How To Do It Series. Washington, D.C.: National Council for the Social Studies, 1981.

Elsele, J. A case for computer literacy. Journal of Research and Development in Education. 1980, 14, 84-89.

Hunter, B. Computer literacy in grades K-8. Journal of Educational Technology Systems. 1981-82, 10, 59-66.

Inskeep, J. Computer literacy: What it is and why we need it. Curriculum Review. 1982, 21, 138-141.

Johnson, D., Anderson, R., Hansen, T. and Klassen, D. Computer literary--what is it? Mathematics Teacher. 1980, 73, 91-96.

Lopez, A. Computer literacy for teachers: High school and university cooperation. Educational Technology. 1981, 21, 15-18.

Luehrmann, A. Computer literacy--what it should be. Mathematics Teacher. 1981, 74, 682-686.

Martorella, P. Microcomputers in the social studies: Applications and issues. A paper presented at the annual meeting of the American Educational Research Association, Montreal, 1983.

Sesow, F. and Stricker, R. Computer literacy: A responsibility of the social studies. A paper presented at the annual meeting of the National Council for the Social Studies, Boston, 1982.

Wells, M. and Bitter, G. The first step in utilizing computers in education: Preparing computer literate teachers. 1982. (ERIC Document Reproduction Service No. ED 218 703)